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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/568,159

02/13/2006

Giuseppe Caputo

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EXAMINER

CHU, YONG LIANG

ART UNIT

PAPER NUMBER

1626

MAIL DATE

DELIVERY MODE

01/17/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/568,159	Applicant(s) CAPUTO, GIUSEPPE	
	Examiner Yong Chu	Art Unit 1626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10 and 13 is/are pending in the application.
- 4a) Of the above claim(s) 5-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 13 is/are rejected.
- 7) ☒ Claim(s) 1-2,4, and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>07/03/2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 3, 11, and 12 have been cancelled by the Amendment filed on 11/13/2007. Therefore, claims 1-2, 4-10, and 13 are pending in the instant application.

Information Disclosure Statement

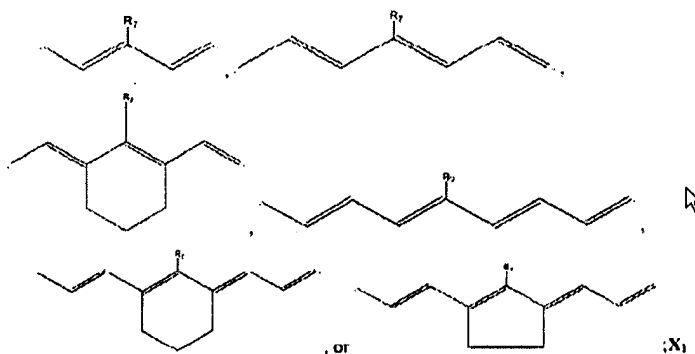
Applicants' Information Disclosure Statement, filed 07/03/2006, has been considered. Please refer to Applicant's copy of the PTO-1449 submitted herewith.

Priority

This application is a 371 of PCT/IB04/51447, filed on 08/11/2004, which claims foreign priority of Italy Patent Application PZ2003000002, filed on 08/12/2003.

Response to Lack of Unity/Restriction Requirement

Applicants traverse the restriction requirement on the ground that the instant application provide a cyanine-type fluorescent marker having two differently-functionalized linker, and have the unity of invention. However, Applicant does not address whether the diverse linker Q is obvious variation among each or not. Instead, Applicant suggests an alternative group XVII, wherein Q is



and X₂ are both $-C(CH_3)_2$, and W₁ and W₂ are both benzene ring or a naphthalene ring without heteroatom substitution.

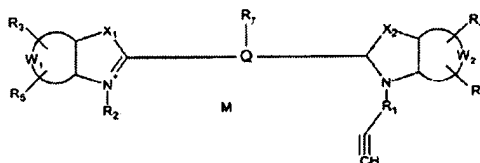
The Office has accepted

Applicant's counter restriction requirement, and withdraw the previous restriction requirement dated on 10/12/2007, and replaced with 2 NEW groups: Group I as "Group XVII", and group II as the remaining subject matters.

Status of the Claims

Elected and Examined Subject Matter

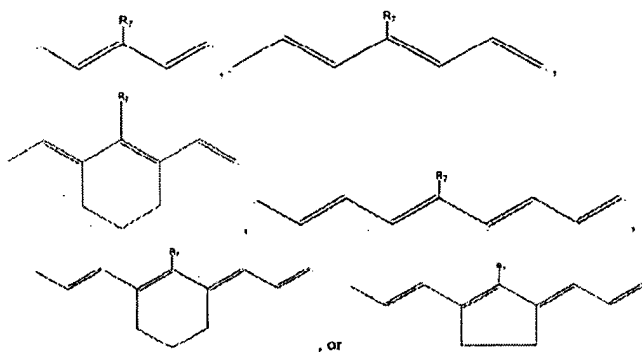
The scope of the invention of the elected subject matter and the examined subject matter is as follows:



A compound of the Formula I

according to

claim 1, wherein: **Q** is



; **R₁** is an alkyl chain;

X₁ and **X₂** are both $-\text{C}(\text{CH}_3)_2$, and **W₁** and **W₂** are both benzene ring or a naphthalene ring without heteroatom substitution.

As a result of the election and the corresponding scope of the invention identified supra, claims 5-10, and the remaining subject matter of claims 1-2, 4, and 13 are withdrawn from further consideration pursuant to 37 CFR 1.142 (b) as being drawn to non-elected inventions. The withdrawn compounds contain varying functional groups,

withdrawn from further consideration pursuant to 37 CFR 1.142 (b) as being drawn to non-elected inventions. The withdrawn compounds contain varying functional groups, which are chemically recognized to differ in structure, function, and reactivity. Therefore, claims 1-2, 4, and 13 are under examination on the merits.

Specification

The first paragraph of the specification does not contain foreign priority document information (i.e. Italy PZ2003000002) to which the instant specification claims benefit from. An appropriate amendment is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 13 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, which is non-statutory category under 35 U.S.C. 101.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 provides for the use of a cyanine according to claim 1 as a fluorescent marker, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

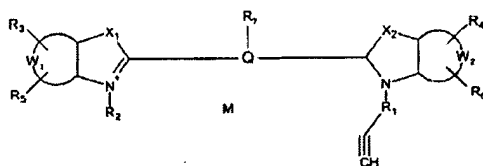
The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 4, and 13 are rejected under 35 U.S.C. 103 (a) as unpatentable over Gaputo et al., US 2002/0065421 ("the '421 application", publication date 05/30/2002) in

view of Takashima et al., *US 2002/0051926* ("the '926 application", publication date 05/02/2002), and Stavrianopoulos et al., *US 2003/0225247* ("the '247 application", filing date 03/12/2002).

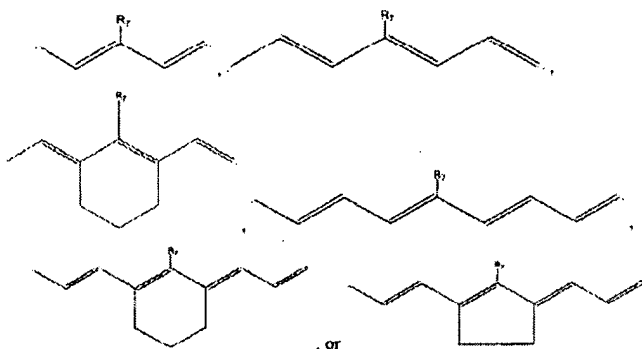
Applicants' instant elected invention of claims 1-2, 4, and 13 relates to a



compound of the Formula I

according to claim 1,

wherein: **Q** is

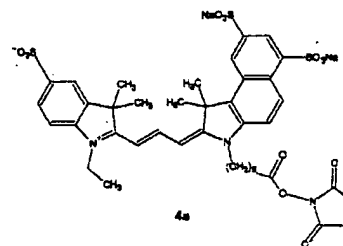


; **R₁** is an alkyl chain; **R₇** is H,

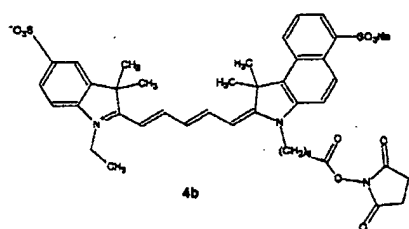
X₁ and **X₂** are both $-\text{C}(\text{CH}_3)_2$, and **W₁** and **W₂** are both benzene ring or a naphthalene ring without heteroatom substitution, and use of the said compound as a fluorescent marker.

Determination of the scope and content of the prior art (MPEP §2141.01)

The '421 application disclosed a class of indocyanine compound used as



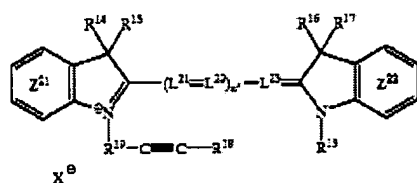
biomolecular labeling reagents with a specific examples



and

in Fig 7.

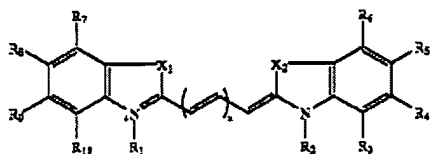
The '926 application disclosed a cyanine-based organic dye of formula (3)



according to claim 20, wherein R^{13} , R^{14} , R^{15} , R^{16} , R^{17} and

R^{18} each represents a hydrogen atom, an aliphatic group, or an aromatic group; R^{19} represents a bivalent aliphatic group; L^{21} , L^{22} , and L^{23} each independently represents a methine group that may have a substituent, and, if L^{21} , L^{22} , and L^{23} each represents a methine group that has a substituent, the substituents may join together to form an unsaturated aliphatic ring or an unsaturated heterocycle; Z^{21} and Z^{22} are benzene rings, with which other benzene rings may be condensed, and the benzene rings Z^{21} and Z^{22} and benzene rings condensed therewith may each have a substituent; n represents 0, 1, 2, or 3; and X^- represents a group capable of forming an anion.

The '247 application disclosed a cyanine-based organic dye of formula

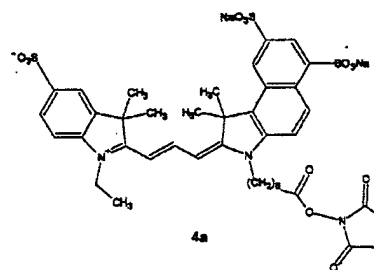


, wherein X_1 , and X_2 are carbon, and R_1 , through

R_{10} are reacting group capable of forming a carbon-carbon linkage with a target, and n is 1, 2, or 3. These compounds are used as dye probe for labeling biomolecules such as DNA, RNA, protein, or peptide as disclosed in abstract.

Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)

The difference between the '421 application and the instantly claimed invention,



is that the '421 application teach an indocyanine dye substituent of alkyl bonding to the indole ring, but not an alkyne ($-R_1-\equiv CH$), as being claimed in the instant application.

Finding of prima facie obviousness--rational and motivation (MPEP §2142-2413)

However, to one ordinary skilled in the art, such difference is *prima facie* obvious over the combined prior art teachings of the '926 application and the '247 application. It is because the '926 application teaches a cyanine dye that have an alkyne ($-R_1-\equiv CH$) attaching to the cyanine core moiety used as a dye. In addition, the '247 application teaches a cyanine dye that have an alkyne ($-R_1-\equiv CH$) attaching to the cyanine core moiety used as a probe for labeling biomolecules such as DNA, RNA, protein, or

peptide. Therefore, the instantly claimed invention is obviousness to the prior art teaching.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 4, and 13 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 6,136,612 ("the '612 patent"). Although the conflicting claims are not identical, they are not patentably distinct from each other because the description as follows:

Applicants' instant elected invention of claims 1-2, 4, and 13 relates to



The image displays several chemical structures of substituted cyclohexenes and cyclopentenes. The structures include:

- 1,3-diene derivatives: $\text{CH}_2=\text{CH}-\text{C}(\text{R}_1)=\text{CH}_2$ and $\text{CH}_2=\text{CH}-\text{C}(\text{R}_1)=\text{CH}-\text{CH}=\text{CH}_2$.
- Cyclohexene derivatives:
 - 1,3-diene derivatives: $\text{CH}_2=\text{CH}-\text{C}(\text{R}_2)=\text{CH}_2$ and $\text{CH}_2=\text{CH}-\text{C}(\text{R}_2)=\text{CH}-\text{CH}=\text{CH}_2$.
 - 1,3-diene derivatives: $\text{CH}_2=\text{CH}-\text{C}(\text{R}_2)=\text{CH}_2$ and $\text{CH}_2=\text{CH}-\text{C}(\text{R}_2)=\text{CH}-\text{CH}=\text{CH}_2$.
- Cyclopentene derivatives: $\text{CH}_2=\text{CH}-\text{C}(\text{R}_2)=\text{CH}_2$ and $\text{CH}_2=\text{CH}-\text{C}(\text{R}_2)=\text{CH}-\text{CH}=\text{CH}_2$.

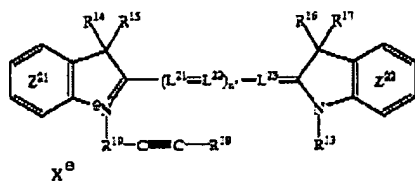
X₁ and **X₂** are both $-\text{C}(\text{CH}_3)_2$, and **W₁** and **W₂** are both benzene ring or a naphthalene ring without heteroatom substitution, and use of the said compound as a fluorescent marker.

The '612 patent disclosed a class of indocyanine compound used as



in claim 1.

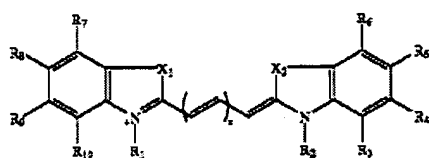
The '926 application disclosed a cyanine-based organic dye of formula (3)



according to claim 20, wherein R^{13} , R^{14} , R^{15} , R^{16} , R^{17} and

R^{18} each represents a hydrogen atom, an aliphatic group, or an aromatic group; R^{19} represents a bivalent aliphatic group; L^{21} , L^{22} , and L^{23} each independently represents a methine group that may have a substituent, and, if L^{21} , L^{22} , and L^{23} each represents a methine group that has a substituent, the substituents may join together to form an unsaturated aliphatic ring or an unsaturated heterocycle; Z^{21} and Z^{22} are benzene rings, with which other benzene rings may be condensed, and the benzene rings Z^{21} and Z^{22} and benzene rings condensed therewith may each have a substituent; n represents 0, 1, 2, or 3; and X^- represents a group capable of forming an anion.

The '247 application disclosed a cyanine-based organic dye of formula



are reacting group capable of forming a carbon-carbon linkage with a target, and n is 1, 2, or 3. These compounds are used as dye probe for labeling biomolecules such as DNA, RNA, protein, or peptide as disclosed in abstract.

Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)

The difference between the '612 patent and the instantly claimed invention, is that the '612 patent teach an indocyanine dye with R_1 and R_2 as a functionalized group as $-COOH$, and phthalimido, but not an alkyne ($-R_1 \equiv CH$), as being claimed in the instant application.

Finding of prima facie obviousness--rational and motivation (MPEP §2142-2413)

However, to one ordinary skilled in the art, such difference is *prima facie* obvious over the combined prior art teachings of the '926 application and the '247 application. It

is because the '926 application teaches a cyanine dye that have an alkyne ($-R_1-\equiv CH$) attaching to the cyanine core moiety used as a dye. In addition, the '247 application teaches a cyanine dye that have an alkyne ($-R_1-\equiv CH$) attaching to the cyanine core moiety used as a probe for labeling biomolecules such as DNA, RNA, protein, or peptide. Therefore, the instantly claimed invention is obviousness to the prior art teaching.

Claim Objections

Claims 1-2, 4, and 13 are objected to for containing elected and non-elected subject matter. The elected subject matter has been identified supra.

Conclusion

- Claims 1-2, 4, and 13 are rejected.
- Claims 1-2, 4, and 13 are objected to.

Telephone Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yong Chu whose telephone number is 571-272-5759. The examiner can normally be reached between 7:00 am - 3:30 pm EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph K. McKane can be reached on 571-272-0699. The fax phone

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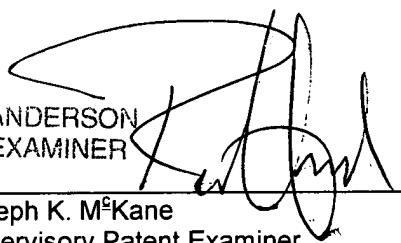
number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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REBECCA ANDERSON
PRIMARY EXAMINER




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